

POLICY RESEARCH WORKING PAPER

WPS 3002

Information-Based Instruments for Improved Urban Management

Uwe Deichmann

Somik V. Lall

Ajay Suri

Pragya Rajoria

The World Bank
Development Research Group
Infrastructure and Environment
March 2003



Abstract

The task of urban managers is to ensure the provision of basic urban services, such as water, waste removal, security, transport, and an environment conducive to economic activity, while maintaining fiscal sustainability of city operations. City managers in developing countries face increasing pressure in achieving these goals because

of rapid urbanization, the larger responsibilities following decentralization, and the economic challenges of globalization. Based on experience in Bangalore, India, the authors argue that effective, forward-looking urban management requires a much better information infrastructure than is currently available in most cities.

This paper—a product of Infrastructure and Environment, Development Research Group—is part of a larger program to improve urban management through the collection, use, and public disclosure of spatially detailed information and analytic methods. The study was jointly funded by the World Bank and the U.K. DFID's Urban Knowledge Generation and Toolkits Program. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Yasmin D'Souza, room MC2-622, telephone 202-473-1449, fax 202-522-3230, email address ydsouza@worldbank.org. Policy Research Working Papers are also posted on the Web at <http://econ.worldbank.org>. The authors may be contacted at udeichmann@worldbank.org, slall@worldbank.org, or sds@nda.vsnl.net in March 2003. (32 pages)

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be cited accordingly. The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the view of the World Bank, its Executive Directors, or the countries they represent.

Information Based Instruments for Improved Urban Management¹

Uwe Deichmann^{*}, Somik V. Lall^{*}, Ajay Suri[¶], Pragya Rajoria[¶]

^{*} Development Research Group, The World Bank, Washington, DC

[¶] Society for Development Studies, New Delhi

¹ This paper is part of a larger program to improve urban management through the collection, use and public disclosure of spatially detailed information and analytic methods, funded by the UK DFID's Urban Knowledge Generation and Toolkits program and the World Bank Development Research Group. The findings reported in this paper are those of the authors alone, and should not be attributed to the World Bank, its executive directors, or the countries they represent. Correspondence pertaining to this paper should be addressed to Uwe Deichmann (udeichmann@worldbank.org) or Ajay Suri (sds@nda.vsnl.net.in). We thank Gero Carletto, Krishna Kumar, Vinay Lall, Peter Lanjouw, Mattias Lundberg, Pulin Nayak, A. Ravindra, Rin Sanga, Zmarak Shalizi, M.R. Srinivasamurthy, M.N. Vidyashankar, and members of the national project steering committee for helpful discussions, comments and suggestions.

Information Based Instruments for Improved Urban Management

1. Introduction

At the beginning of the 21st Century, over 50 percent of the world's population lives in cities. The growth rate of urban population is four times the rate of rural population. It is estimated that the number of people living in urban areas will double to more than 5 billion between 1990 and 2025, which means that approximately 65 percent of the world's population will then be living in towns and cities. About 90 percent of urban growth will occur in developing countries. This process of rapid urbanization is accompanied by increasing disparities in income distributions and a rising proportion of the poor in developing countries – clear indicators of low quality growth. At the same time, with increasing levels of decentralization in many countries, local decision makers are given far more responsibility for designing policy instruments for improving the quality of life of their residents while also increasing the competitiveness of their regions in a global production and trading network.

In order to improve the effectiveness of local policies and programs, there is a need to develop local capacity and appropriate incentives for the collection and use of locally relevant information and analytic methods to identify, evaluate, and prioritize policy and planning issues. As succinctly stated by Cohen (2001):

“The challenge for urban assistance is no longer simply to provide circumscribed packages of physical aid as might have been understood in the past but, rather, to ask how the capacity of local institutions can be strengthened in order to manage these increasingly complicated urban problems in environments of diversity and change. [...] Investing in understanding how to ensure economic and social opportunities in cities may be one of the most important social and research investments which the world could make as it starts its first ‘urban century’”.

To address some of these issues, a team of researchers at the Development Research Group at the World Bank in partnership with the Society for Development Studies (SDS), a policy research and training center in India, has started a policy research program to examine how public dissemination and use of spatially detailed data can help improve quality of life in urban areas, particularly those operating in weak institutional settings. The goals of this research program are:

- Engage in collaborative efforts between local governments, researchers and the World Bank, along with the private sector and NGOs to encourage collection and use of spatially detailed data and related analytic tools for urban planning and policy applications.

- Emphasize the importance of data validation and public dissemination to encourage transparency, accountability, and participation in the decision making process, and to make service delivery more responsive to user needs.
- Help enable metropolitan areas to develop policies and programs based on credible, geographically detailed information and rigorous social and economic analysis.

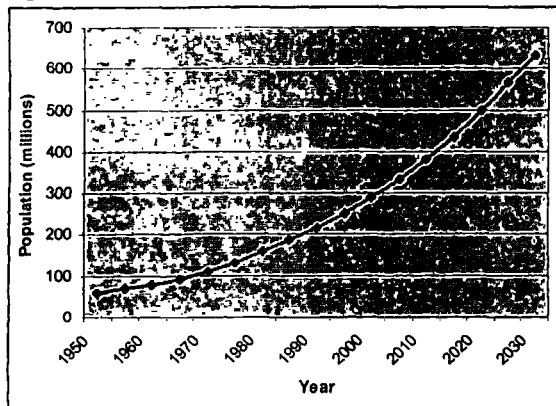
The initial geographical focus of the work program is in South Asia, where we are currently working with several Indian cities. With additional resources, we plan to expand this program to urban areas in other countries and regions.

This paper is organized in three broad sections. Section 2 summarizes three broad trends that currently influence urban management in developing countries. In Section 3, we discuss the major challenges that are faced by local urban decision makers in ensuring a high quality of life for current and future residents, while maintaining fiscal sustainability of local government functions. Section 4 describes the motivation, implementation and some initial results of a comprehensive, spatially referenced urban household survey that we carried out in Bangalore (the first city where we are working as part of this policy research program). Section 5 concludes.

2. The context: Trends that shape urban management

Continuing rapid urbanization: Between 1950 and 2000 India's urban population increased from 62 million to 288 million, an average annual increase of about 3% (UN 2000). Even though urban growth rates are expected to drop by about half a percentage point over the next three decades, the total urban population is likely to reach more than 600 million by 2030 (Figure 1). That means that most cities will more than double in size. Already strained to provide services and quality of life to existing urban residents, city managers will face tremendous challenges in expanding existing infrastructure and avoiding deterioration of living standards due to congestion, pollution, and lack of basic services. A doubling of population over the 30 years means that by 2030 there will be a second Mumbai, a second Calcutta, and a second Bangalore that needs to be fed, supplied with water, sanitation, and electricity, given public and private transportation options, and whose garbage needs to be disposed of. These new populations will consume a vast amount of semi-rural agricultural land currently surrounding these cities—a prospect that highlights the urgent need for forward-looking land use planning.

Figure 1: Urban population in India, 1950-2030



Source: United Nations World Urbanization Prospects, 1999 Revision.

Decentralization: in India, as in many other developing countries, urban policy has traditionally been developed centrally by the national government. Consequently a very large share of urban expenditures is allocated by the central government with scant concern about specific local circumstances, leading to what Dillinger (1995) calls the “*overcontrolled local sector*”. The task for local decision makers was largely to implement strategies designed centrally according to budgetary constraints set by the government. With recent institutional and regulatory reforms, as a consequence of the 74th Amendment of the Indian Constitution, more administrative and fiscal functions have been

devolved to local authorities. Cities now need to design strategies to maintain and improve public services, and they need to come up with ways to finance these activities in a sustainable manner.

With increasing responsibility comes increasing accountability. The central government is less likely to cover deficits in case of budget overruns or fiscally irresponsible programs. Provision of services therefore needs to be linked much closer to cost recovery through taxes, user charges or other levies. Likewise, urban planning and management can not be limited to physical, architectural or engineering issues. Instead an urban manager requires the multi-disciplinary expertise of an economist, financial analyst, sociologist, regional planner, administrator and decision maker, among others. In this process, rather than using general recipes, decision makers need to develop policies that are relevant to the specific, idiosyncratic conditions in their own city. This requires enhancing analytical capacity within the city, which in turn needs to rely on up-to-date, policy relevant information.

Administrative and fiscal decentralization tends to be accompanied by political decentralization. Many local authorities encounter an increased level of community involvement in decision making and the assumption of a watch-dog function by private citizens and NGOs. Urban public performance audits or scorecard projects put greater pressure on local authorities. In an open, democratic society, disclosure of public information levels the playing field between all stakeholders. This is the fundamental basis for a constructive dialogue between administrators and local residents. The result is urban management that is guided closely by the needs of the community.

Globalization: At the same time that cities face ever growing local challenges in providing services to rapidly growing populations while maintaining fiscal stability, outside pressure can put tremendous short-term strain on the local economy. The macroeconomic consequences of trade liberalization have been well studied and are widely debated. But these policy changes often have direct repercussions at the local level. Since the agricultural sector tends to remain more protected, these impacts are felt more directly in urban areas where manufacturing and service industries are concentrated. Some cities may gain, if they have industries that are competitive in international markets. Increase in market size will enhance productivity, which translates into more investment, increased revenues and improvements in living conditions in the city. On the other hand, economic liberalization can have severe implications for specific economic sectors within a city. For example, the lowering of Indian import tariffs on toys has quickly wiped out employment opportunities for thousands of small-scale toy manufacturers in Delhi who have not been able to compete with cheaper imports from China (CII 2001; see also Beall 2002). The benefits of trade liberalization, such as lower prices for consumers, tend to be spread widely and are thus almost imperceptible. The cost of such policies, however, are

often borne by specific industrial clusters and communities. This triggers difficult restructuring and adaptation processes with profound impacts on the urban economy and social fabric. It is the local urban manager who has to respond directly to the social welfare consequences, for example, by facilitating the development of alternative income opportunities.

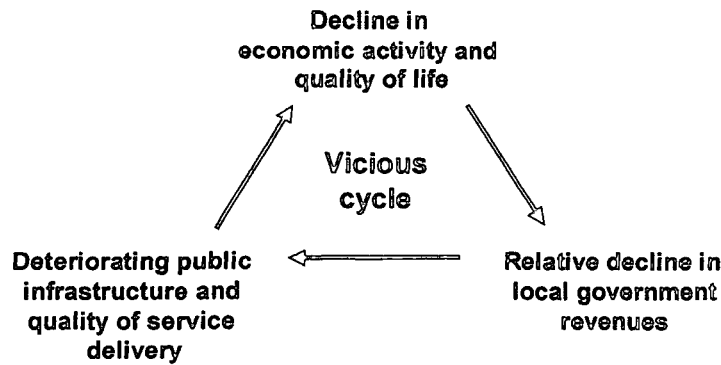
3. The challenges for urban decision makers

Dealing with the changing environment characterized by rapid urbanization, decentralization and globalization requires sound management, but also a strategic vision for the future of the city. Cities should develop a realistic assessment of what developments will shape their future over the next 10, 20 or 50 years. Most cities will have some idea of their role and function in a national urban system, such as whether they aim to be a globally competitive city that can attract significant foreign investment, or a local center that serves domestic markets. Cities need to balance growth with maintaining quality of life. A fast growing city will attract investment for some time. But at some point, congestion, pollution and other negative externalities can diminish its attractiveness to outside investment. Revenue from economic activity may then become insufficient to cope with increasing welfare expenditures and other mitigation needs.

Increase revenues and expand services

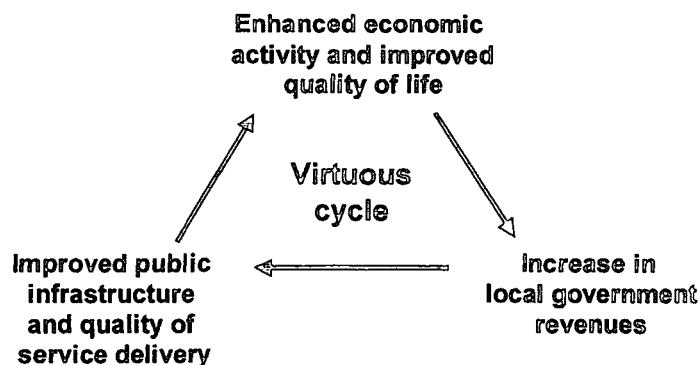
Many cities are faced with growing fiscal deficits that threaten to spiral into a vicious cycle (Figure 2). Due to insufficient local revenues, less is spent on public infrastructure and service delivery. Inefficient allocation of scarce funds, high transaction costs due to a lack of accountability, and the absence of strategic determination of priorities often exacerbate fiscal crises. As a consequence quality of life and the enabling environment for a vital economy deteriorate. Businesses will not find the infrastructure required to maintain input and output linkages, lack of jobs will increase the welfare burden and worsen social problems, and essential public services cannot be maintained and expanded. The private sector may step in and develop substitutes for public services such as own generators, employee transport and housing, etc. But this is typically more expensive than the public alternatives and thus leads to decreasing productivity and profitability (Kessides 1993). The result is a decline in economic activity and in the quality of life for urban residents. Consequently, the eroding tax base will reduce funding available for vital government functions. This shortfall can also not be replaced by user fees or other direct charges as residents and businesses will be wary to pay for services whose quality is declining.

Figure 2: Vicious Cycle



Cities that are faced with such dynamics must attempt to turn this vicious cycle into a virtuous cycle. An expansion of the tax base will lead to an rise in local government revenues. This can be achieved either by increasing the economic base through new business investment, or by improving the efficiency of tax collection, for instance by revising property tax regulations and by ensuring all properties are captured in the tax records. Increased revenue allows a higher level of public investment for providing an environment conducive to economic activity and to improve residents' overall living standards. To achieve the highest return of public investment, spending needs to be based on strategic objectives and sound evaluation of alternative uses of public funds. This will ensure that services are responsive to the needs of the users of public infrastructure and that new residents are provided with basic necessities and opportunities. Better public services will increase the productivity of the city and thus result in enhanced economic activity, higher quality of life, and consequently increased revenue available for public investment.

Figure 3: Virtuous Cycle



Turning the vicious into a virtuous cycle requires the collective efforts of city government and citizens. Urban residents are unlikely to agree to higher taxes and charges if they are uncertain whether the resulting funds will be put to good use. Residents need to be convinced that increased charges will

lead to increased, equitably distributed services. This can only be achieved if citizens are well informed about the current status, intended policies and measured outcomes. *The collection, analysis, interpretation and public disclosure of credible information is thus an essential component of improved urban management.*

Achieve and maintain fiscal sustainability

A key challenge to all public managers is fiscal stability. The local government needs to design an optimal mix of revenue generation instruments that allows it to perform its assigned municipal functions and that is fiscally sustainable, socially fair, and administratively feasible. The main revenue sources for local governments are user charges, taxes and transfers from other levels of government. Among these, transfers of centrally raised revenues are likely to become a less significant source of funds as decentralization continues and the mandate to raise funds moves down to local authorities. At the same time, local governments obtain greater independence in determining the sources and composition of instruments for expanding fiscal capacity.

Property taxes

Property taxes are one of the most important sources of funds for investments and maintenance that cannot be covered by direct charges (Bahl and Linn 1992). In weak administrative and institutional settings, revenue collection for property taxes is limited by several factors including an often incomplete inventory of all properties in the jurisdiction, lack of adequate training for appraisers, and informal agreements between the appraisers and the property owners. Furthermore, distortionary effects of rent control limit property transactions or lead to informal dealings and make effective valuation of properties difficult. For a property tax system to be effective and efficient, it is necessary to have

- A functioning (formal) market for property.
- A network of professional appraisers.
- A mechanism for sharing information about property characteristics and property transactions.
- A sophisticated administrative infrastructure.

Many of these characteristics are not present in developing country cities. Instruments such as increasing marginal tax rates may result in an undue burden for poorer population groups and may, in general, not be acceptable politically. Unless all properties are registered, increased rates will only

apply to those homeowners who happen to be included in the property registry, thus worsening an unfair assessment of charges. Increasing the tax base through “discovery” of unregistered properties is the preferable option for expanding fiscal capacity. In the absence of publicly available, accurate and up-to-date information on property values, property tax compliance will be limited as home owners will attempt to avoid or reduce taxes through misreporting and informal agreements. In the larger research program on fiscal capacity we are interested in examining the following questions:

- What can urban local government do to increase revenues raised from property taxes?
- What is the distributive burden of commonly used instruments for revenue generation?
- What is the effectiveness of programs designed to reduce costs associated with property tax administration?

Several Indian cities have implemented property tax self-assessment schemes, in which home owners estimate their tax burden according to a simple set of rules. This makes the assessment process transparent, reduces administrative costs and reduces opportunities for informal arrangements between home owners and tax assessors. However, for any property tax system to be efficient and fair, it must meet several conditions:

- There must be a complete inventory of properties in the jurisdiction since otherwise registered home owners end up subsidizing those that are not on official records. Given the lack of cadastral systems, the general paucity of up-to-date geographic information and the limited enforcement of construction permits in many cities, few cities will have a complete listing of all properties. Full “discovery” of all properties should thus be a priority for expanding the revenue base.
- To avoid distortionary effects in the burden of property tax, charges need to be closely related to the actual value of the property. People who live in similar dwellings in similar neighborhoods should pay similar taxes. The city faces a critical trade-off. To be effective, the system needs to be as simple as possible. That means a minimum number of indicators should be used to determine the assessment, and these indicators need to be easy to measure and verify. To be fair, however, all relevant characteristics that determine the housing unit’s value need to be considered. These include both the property’s own characteristics as well as the characteristics of the location.
- Property tax appraisal through self-assessment reduces administrative costs, since assessors do not need to visit each property. However, the critical concern about such systems is

compliance. There is a greater scope for misreporting, if penalties are not severe, enforcement is lax, and accurate information on the value of the property is not easily available. An independent and inexpensive mechanism for determining approximate values of properties could generate a warning flag if a self-reported assessment is considerably different from the value that would be expected given the properties' characteristics and location.

What would be required to improve a self-assessment scheme? Better information can help address some of these issues. Properties are geographically distributed across a city and location is the prime determinant of land values (Can 1992).² Proximity to employment and entertainment opportunities, amenities such as parks, and disamenities such as railroad tracks or polluting industries, will have an impact on land values and consequently on the value of structures built on that land. Spatially detailed information on the location of properties, their size and their proximity to factors that determine land values will facilitate estimation of housing values (Adair et al. 1996). New spatial technologies such as high resolution satellite data, digital air photos and geographic information systems provide the tools to aid in developing a complete inventory of all properties and to determine location parameters that influence property values. Additionally, a set of observed or surveyed housing values is required to inform the assessment schedule. Such data can be obtained through surveys or through assessor records. Based on these pieces of information a simple system can be built that predicts housing values and thus the likely assessment based on a minimum set of indicators. The prediction can be cross-checked with self-assessed values and appraisers need to be sent out only to those properties where there is a large discrepancy.

An institutional problem related to local tax administration and service provision is that service-specific charges or cesses are often added to property taxes. The resources from these surcharges tend to flow directly to the service providers (e.g., water utilities) rather than to the local administrative body. The city managers receive no feedback on the use of these funds. Such information would facilitate the design of an overall system of taxes and charges that balance revenue generation and social objectives. SDS has therefore started a parallel project to develop an integrated property tax instrument that will contribute to the urban local administration becoming a more effective city manager.

² With the exception of places where significant distortions in land markets are present.

User charges and willingness to pay

Problems with service provision in developing country cities are typically seen as an issue of resource constraints. The solutions are sought in increasing public investment in infrastructure, with funding coming from higher levels of government or donors. Yet, as Dillinger (1995) points out, there are considerable local resources devoted by municipal governments to provide services and by citizens to pay for public as well as private services. The problem is often not with resource constraints and ability to pay, but with management of service delivery including institutional arrangements, realistic pricing, cost recovery and benefit incidence analysis of alternative service delivery options.

Sound fiscal management requires careful pricing of publicly provided services. Yet, public service charges are often set without consideration of either affordability or welfare impacts of different pricing policies. Planning of service provision is also frequently not coordinated with other providers including private vendors and community-based initiatives. The poor sometimes pay considerably more for basic services such as water because they need to rely on expensive private provision when the public service network does not extend to their residences. Publicly provided water, often at subsidized prices, for instance only benefits those residents that are connected to the water supply network (Hentschel and Lanjouw 1998). This tends to benefit better-off residents in formal settlements while poorer people may need to resort to more expensive private supply options.

Some of the price distortions and rationing of basic services may be due to political realities or to actual cost differences in service provision. But shortcomings in pricing policies are also due to the lack of information about the ability and willingness to pay for services, and about the relative distributional impacts of changes in prices. Full cost recovery is not always possible given the necessity of providing essential livelihood-sustaining services to all citizens. But sometimes subsidies are in place that do not benefit those who require them most. On the other hand, poorer households are often able and willing to pay relatively high charges which make cost recovery a realistic proposition. Higher revenues for the utility may allow an expansion of the service network, which in turn increases scale economies and leads to a reduction in unit cost of service delivery and, ideally, to lower prices for all consumers. Rather than assuming *a priori* that subsidies are essential, pricing policies should be developed based on credible information. Such information can also help overcome the resistance to changes in subsidy levels that is likely to come from those who have benefited from them – these are not necessarily those who would need support the most.

A comprehensive household survey can generate credible information on service delivery

characteristics and on the willingness and ability to pay for public services.³ Such surveys yield several complementary pieces of information that provide a comprehensive basis for assessing pricing of basic services:

- Revealed willingness to pay for a given level of service through information about who provides the service, the consumption quantities and prices paid.
- Stated willingness to pay through contingent valuation questions.
- Coping costs and complementary investments, which can be considerable where service is often interrupted.
- Quality of service and satisfaction with current levels of service provision.

One caveat in many WTP studies is that they assume only one desired level of service that is appropriate for everyone. Since ability to pay for services differs among citizens, it may be preferable to offer residents a choice of service levels, with a premium charged to those who desire better services.

User feedback / scorecards

Increasing revenues through a streamlined property tax system will be acceptable to the urban population if there is widespread perception that these revenues are well spent to provide services and an efficient social and economic infrastructure. Voice and exit are two main response mechanisms available to the public for influencing accountability of service providers. The use of these terms became popular following Hirschman (1970), who discussed how consumers cope with performance deterioration of goods and services. 'Exit' is an efficient strategy in competitive markets with a large number of alternatives and a limited degree of market failure. Service users can simply switch providers and the service provider is therefore keen to provide adequate service at a fair price. 'Voice'—publicly expressing dissatisfaction with existing service levels to put pressure on the provider—is an alternative when citizens have no choice but to obtain services from a single provider. Most network infrastructure services such as piped water supply, sewerage, and electricity are natural monopolies due to high cost of entry, considerable economies of scale in provision, and network externalities. In these circumstances, exit strategies are limited—especially for the poor.

³ See Walker et al. (2000) for examples related to water service delivery in Central America.

One method of expressing ‘voice’ that has recently become popular among citizen groups and NGOs is the use of ‘scorecards’, on which residents express their degree of satisfaction with services received and grade local government performance in providing various services (Paul 1991, 1998). These have been used in many cities (for example, in Bangalore, Calcutta, Mumbai and Delhi in India, but also in Metro Manila and Seattle). Scorecards are useful for raising public awareness, point to existing shortcomings in service provision and are valuable tools for advocacy.

Unless user feedback is accompanied with objective information, however, scorecards provide only limited information to local decision makers as to what should be done about problems in service delivery. Satisfaction is the difference between expectation and actual service delivery subject to various modifying factors—income, education, and tenure stability, among others. If expectations are exceedingly high, satisfaction may be low, even though services are adequate in comparison to overall standards. We can evaluate satisfaction objectively only, if we can measure the actual level of service provision, while correcting for factors such as the level of complementary investment by households. For instance, a household may have invested in coping mechanisms such as water storage tanks or electric water pumps to compensate for the lack of reliable piped water supply. These are sunk costs for the household that may long be amortized. Satisfaction with the service may thus be high even when the performance of the utility is poor. Thus user satisfaction surveys should be supplemented by credible, measured and monitored information in order to obtain a full picture of current status of service provision.

Benefit-incidence analysis

Improved information about actual levels of service provision and general household characteristics also improves planning the expansion of service delivery, targeting of investments and pricing and subsidies. City managers must be able to answer questions such as:

- What income groups benefit most from subsidized services and public infrastructure?
- Who is most affected by gaps in service provision?
- Do public transport networks properly link workers’ residences with job locations?

Answering these questions requires spatially explicit, comprehensive information on the distribution of services provided by the city, the socioeconomic characteristics and welfare status of households, and the cost of improving service levels in different parts of the city. A first step is to determine what socioeconomic groups or what geographic sections of the city benefit most (or least) from public

services. For instance, benefit-incidence analysis can determine what socioeconomic strata capture what share of total expenditures on services after accounting for payments of user charges. The results can then inform programs that focus on underserved communities.

Community participation

In rapidly growing cities, governments are frequently overextended in their attempt to provide services to all residents even if public fiscal and operational management is fundamentally sound. Private providers can sometimes fill in gaps in service provision. For instance, independent contractors provide cost-effective water or garbage collection services in parts of some cities. But in many cases cost recovery, which is desirable for the public sector but essential for private entrepreneurs, is not possible. There is thus little incentive for the private sector to become engaged.

Community based service provision may address service gaps where the public sector is unable and the private sector unwilling to supply basic services. Such initiatives have been documented, among others, by Kahkonen (1999), Isham and Kahkonen (1999), and Pargal et al. (1999). However, there is still very little evidence about the determinants of success in community based efforts. Secure tenure, education, welfare level and gender have been suggested as individual household characteristics that influence willingness to participate in community efforts. Following the literature on participation in social activities in the USA, recent research focuses on community characteristics, in particular whether homogeneity in endowments or culture within a neighborhood or community influence participation rates (Alesina and La Ferrara 2000). Evidence in developing countries, however, is so far limited. Lall et al. (2002) present an analysis of the effect of cultural heterogeneity on the willingness to participate in community efforts using data from the Bangalore household survey presented below.

While we do not have sufficient evidence on what drives community efforts, we also have only relatively little knowledge about how well such efforts work in practice, over longer time periods, and at a scale that makes a significant contribution to city's overall welfare. The basic assumption among donors and NGOs is that community based service provision is a valuable complement to other forms of service delivery. But we do not know whether this generally holds true or under what conditions community based service provision is more cost effective, provides better quality infrastructure or is socially preferable to government or private-sector provision.

Information and information management needs

Meeting the challenge of providing services to a rapidly increasing urban population while maintaining fiscal stability requires detailed information about the past and current status of the city as well as the skills to process and interpret this information. City managers must be able to assess the current status of public service provision in the city on the basis of credible information. They must evaluate who receives which services, how much users pay for those services, how much it costs the city to provide them, and how satisfied users are with current service levels.

Table 1: Some sources of urban socioeconomic information

Data source	Advantages	Disadvantages
Population and household census	Provides reliable sub-city level information.	At best only available every ten years; limited number of indicators; results are sometimes not published at sub-city level; long lag between data collection and publication.
Comprehensive, multi-topic household survey (LSMS, DHS, NSS)	Very rich source of information on many aspects of household welfare	Usually a national level survey that does not yield reliable sub-city or even city-specific data.
Short, sector-specific surveys (e.g., slum survey, commuter survey, service satisfaction and needs survey)	Can provide information quickly and at fairly low cost; ideal for monitoring through repeated surveys (e.g., annually).	Often not designed to meet statistical requirements (sampling, etc.); small sample sizes – not representative at sub-city level; focused on limited number of issues making more comprehensive analysis difficult; may not yield city-wide information.
Facility surveys	Provides information on the supply-side of service delivery that can otherwise be difficult to monitor (e.g., health, education).	Often difficult to assess quality of service provision beyond purely quantitative indicators such as number of doctors or teachers.
Industry census	Yields information on city's economic base; productivity of city businesses; provides employment related information.	Actually a survey in many countries; in most cases no city specific indicators can be extracted.
Transactions data (e.g., birth/death register, vehicle registration, cadastre, etc.)	With good data management, information base is always up-to-date; serves many administrative functions.	Limited number of indicators; can be expensive to maintain electronically.
Participatory data collection and rapid appraisal (e.g., regular reporting by ward representatives; focus group interviews)	Involves citizens; low cost; provides rich contextual information.	Difficult to maintain data quality and objectivity; not possible to extrapolate to other parts of the city or to city as a whole.

The city government must also anticipate future needs. Rather than attempting to simply catch up with shortfalls in service provision, city managers should be able to anticipate future needs based on realistic scenarios of population growth and expansion of city boundaries. Pro-active policies can avoid many problems that are difficult to remedy retroactively.

The information base to make such decision, however, is quite poor in many places. Table 1 presents possible data sources that can be utilized for urban management. Most cities have only limited data collection mechanisms in place, and externally generated information, such as census data, is scarce and often not up-to-date. We therefore argue that cities need to implement their own data collection

strategies that can be tailored to address the needs of local urban management. A comprehensive household survey is the best instrument to collect sufficient information. Many countries have implemented nationally representative, comprehensive household surveys to obtain base line information and to monitor changes in all aspects of household welfare. In cities where such information is unavailable from other sources, such survey programs can yield the same benefits for local decision making. We discuss some issues related to urban household surveys in the following paragraphs:

1. Household surveys can vary in complexity from being very comprehensive, such as the Living Standards Measurement Surveys that can have 8-10 modules, to short special purpose surveys such as a reconnaissance of users of public transportation. An interesting model that can be adapted to the needs of urban management is the Core Welfare Indicator Questionnaire (CWIQ) used for national level surveys.⁴ The relatively short questionnaire and easy data entry protocols reduce the cost and increase the speed of data collection. This makes it feasible to conduct regular surveys with large sample sizes that support monitoring and impact evaluation at the sub-city level. The surveys consist of a fixed core module that collects essential household information, and one or more flexible modules on specific topics, which can be modified or rotated in repeated surveys.
2. Public policy requires consideration of the welfare impacts of any decision making. Design of tax regimes, user charges or subsidies will typically affect different population groups differently. To avoid unintended consequences, the city government must be able to ensure that policies do not put an undue burden on the poorer population groups. Any data collection effort should thus consider collection of information that allows a quantification or ranking of the welfare status of households.

⁴ <http://www4.worldbank.org/afr/stats/cwiq.cfm>

3. Information collection strategies should have a long time horizon. Monitoring and impact assessment can only be carried out if data are collected over time and indicator definitions, sampling schemes, etc., are comparable.
4. There is a delicate trade-off between the survey size—both, in terms of sample size and length of questionnaire—and the cost of the survey. A larger sample size yields data for small geographic areas such as neighborhoods in the city. Since cities are not homogeneous entities, such information is useful for targeting and priority setting. A longer survey instrument will provide more indicators that can be combined to do cross-sectoral analysis. But both will increase the resources required to conduct the survey.
5. Since information gathering and management is expensive, cost sharing between different agencies can yield large benefits. The larger the number of users of the information (inside and outside the government), the larger the societal benefits.
6. Similarly, returns on the investment in data collection are higher when several data sets can be linked. For instance, a facility survey could be linked to household survey data to find out who uses which services at what frequency. Or, a survey of informal sector establishments could be linked to information on the household characteristics of their labor force.
7. Availability of information is crucial for urban decision making, but equally important is the ability of city managers to process and interpret the available data.
8. Public availability of information and transparency is the key to sound management. Citizens must be in a position to evaluate the performance of city government. To do that they should have access to the same information base. In other words, information should flow both ways: Households provide information to urban managers, who publicize the aggregated evidence that informs public policy discourse.

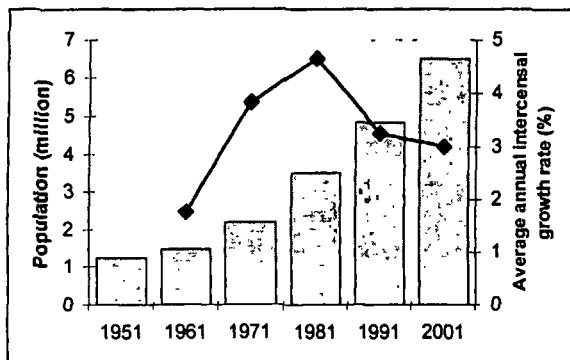
4. Urban household survey in Bangalore

To address some of the issues discussed in the previous sections, we carried out a comprehensive household survey in the city of Bangalore, Karnataka state. With a population of 5.68 million⁵ Bangalore is the fifth largest metropolitan area in India. The population of the city has increased significantly during the last 3 decades. Bangalore has been the fastest growing metropolis in the country. During the period 1971-2001, Bangalore's population has grown by 4.2 per cent per year as

⁵ Data relate to Bangalore Urban Agglomeration, Census 2001

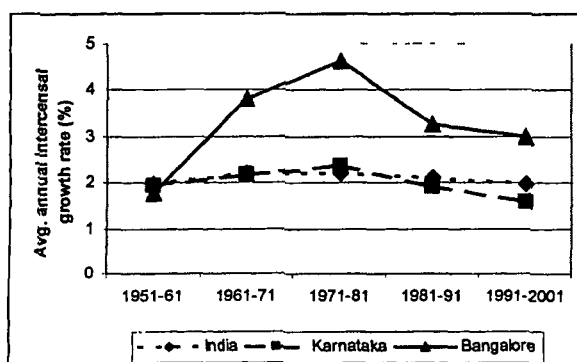
compared to 3.1 per cent in Karnataka urban and 3.3 per cent for the urban population in India as a whole (Figure 4 and Figure 5). In this period, the city underwent an extraordinary transformation into an important technology, industrial and educational centre. As the “Silicon Valley of India”, the city has a cosmopolitan culture, a network of high-tech industries, and growing affluence. At the same time, the rapid growth in economic opportunities has left large segments of the population behind, with large slum populations living in pockets of poverty throughout the city.

Figure 4: Population Growth in Bangalore, 1951-2001



Source: Census of India

Figure 5: Population Growth Rates in India, Karnataka and Bangalore, 1951-2001



Source: Census of India

The Bangalore survey was the first of four urban household surveys that will be implemented in the course of this project. The survey was designed in close coordination with city managers and after extensive consultations with city officials, private sector representatives and NGOs. The design of the survey instrument was jointly undertaken by DECRG and SDS. In Bangalore, SDS has field experience of more than a decade, which greatly benefited survey design and implementation. The

Bangalore Local Urban Observatory (BLUO), a UN HABITAT project established by SDS⁶, was the nodal point for the data collection activities. The survey design was guided by the following principles and objectives:

- The survey should provide a comprehensive image of the city, but should be manageable. An interview time of one hour was seen as an absolute maximum. In the trade-off between sample size and the number of survey questions, we opted for a larger sample in order to facilitate geographic analysis of survey outcomes.
- A key component is a comprehensive consumption module that provides information on the welfare status of each household. This allows us to produce a poverty profile for the city and enables the assessment of welfare effects of city policies (see, e.g., Hentschel and Seshagiri 2000).
- The household roster and associated questions are compatible with the questions contained in the March 2001 Census of India. This provides a cross-check of the survey's representativeness and will allow future use of small area estimation techniques to produce a detailed urban poverty map—e.g., poverty rates by enumeration areas or city blocks.
- Two substantive modules collect information on housing and water supply. The former is mainly designed to provide data about the fiscal situation: housing finance and property taxes, as well as detailed information on property characteristics to allow estimation of hedonic housing price models. The urban service provision module includes questions on the status of water supply, user satisfaction with various aspects of service provision and willingness to pay for improvements.
- A prime objective is to analyze survey results spatially. We collected a latitude/longitude coordinate pair for each household in the survey. This allows mapping of survey results, re-aggregation and indicator calculations for geographically defined zones in the city, and integration of survey data with GIS-derived variables.

Survey results have been summarized in a publicly disseminated report published jointly with the Bangalore Local Urban Observatory and SDS (BLUO/SDS/WB 2002, SDS 2002). Incidentally, Bangalore has been the focus of a comprehensive socioeconomic study before. In 1979, Rao and Tewari published "*The Structure of an Indian Metropolis. A Study of Bangalore.*" That study was aimed at describing city structure and dynamics with respect to demography, social relations, and economic and ecological conditions. It also had a strong planning perspective because one of the goals of the study was to support city development strategies. Finally, that study intended to provide a

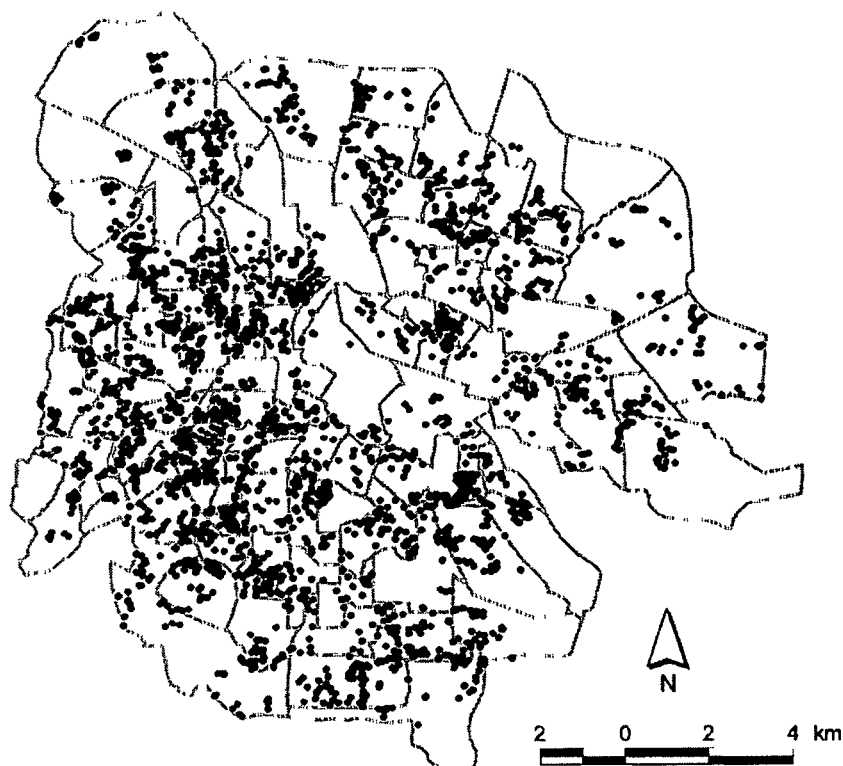
⁶ This initiative included the Bangalore City Indicators Programme (BMRDA/SDS 2002).

database for many other uses as well as a base line for future studies. Our own survey of Bangalore, while not entirely comparable with this previous study, has very similar objectives.

Sample Design

The Bangalore Urban Survey was designed to be representative of the Bangalore City area. According to preliminary 2001 census results, this area has a total population of 4.1 million and 930,000 households. The city area is divided into 100 wards. All households of the city are part of the sampling universe with the exception of residents of military cantonments and institutional populations (e.g., prisons). The target sample size was 3000 households, and the final sample size is 2905. This sample size yields acceptable sampling errors for all important parameters and allows for the disaggregation of survey indicators into at least 5-7 strata. To ensure that all parts of the city are covered by the sample, we chose sample fractions in each ward in proportion to the number of households of that ward according to the preliminary estimates of the Census of March 2001.

Figure 6: Bangalore survey locations and ward boundaries

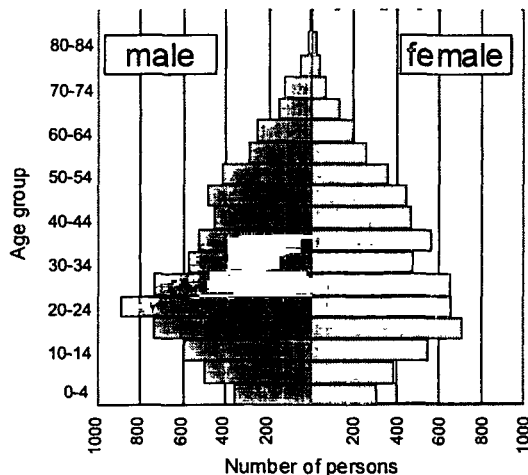


We did not have access to the household listings from the 2001 census for use as a sampling frame. Instead, the master sampling frame consists of the most recently available electoral roles. In India these roles are typically very complete. There is no reason to believe, for example, that slum

populations are omitted, because these populations represent important vote banks for local politicians. Within each ward, the sample taken was completely random. Due to the nature of an urban survey, where travel times are short, there was no need to resort to cluster sampling and its associated complications. Figure 6 shows the distribution of sample points within the Bangalore urban area.

The sample population of 13,453 has a sex ratio of 875 females per 1000 males, which is lower than the 906 for Bangalore district according to the Census 2001 data.⁷ The lower sex ratio is likely due to the large number of single male migrant workers and the large number of male students in the many technical colleges in the city. This is reflected in the population pyramid in Figure 7, which shows a much larger number of males in economically active age than females. Migrants come alone to the city, in search of employment, and initially stay with relatives. Although these single member households are using the urban services, the service providers often do not consider their requirements in demand assessments. Since many of the services are charged at a flat rate, the additional usage is a net revenue loss to the service providers. The average size of sample households is 4.6 and is comparable to the average of 4.5 for the Bangalore municipal area according to the provisional results of the Census 2001. Detailed results from the census will show whether the low number of children in the 0-9 categories are due to respondents' not listing small children in some cases, or whether this is indeed a reflection of the changing demographic structure in a modern Indian city.

Figure 7: Age and sex distribution of the survey population



Source: Bangalore Urban Household Survey, 2001

⁷ The detailed census figures for Bangalore Urban have not been released yet.

Questionnaire

The survey is divided into four modules: household information, consumption and expenditures, water supply, and housing. Survey design was aided by four focus group interviews carried out by social scientists from SDS. The four groups with whom discussions were held were residents of a squatter settlement (“cement huts”) near the center of the city, a regularized slum settlement, an authorized revenue site, and an upper-middle class section of a former military officers colony. Information from these four sets of interviews is, of course, anecdotal, but these groups of Bangalore residents represent a cross-section of socioeconomic profiles. Informal information from these interviews proved invaluable for structuring the survey instrument, ensure that important options, for example, for types of water supply were included, and also shed some light on the motivations of different groups in answering household survey questions. For example, residents in the regularized slum, when asked how much they would be willing to pay for reliable water supply, mentioned sums that seemed far beyond their means. Upon further questioning they said that they would state a willingness to pay almost any amount. They speculated that if the new water supply were installed, it would not be removed even if they then refused to pay.

Household module

The survey includes confidential control information such as the address and names of the household head, the respondent, field staff and supervisors. These enable follow-up in case of problems, but are confidential and will not be released with the completed data set. General household information starts with the gender of the respondent, which allows the testing of gender differences in responding to various questions. Next we asked about the religion and main language of the household, and type of family. Several questions cover the household’s relationship to agricultural land. In an area where rural-urban migration is common, it is interesting to test what linkages to the rural sector remain among urban residents who may have come to the city a long time ago.

The main component of the household module is the household roster, which captures a number of characteristics for each member of the household. The household roster used in this survey was designed to be very similar to the one used in the census. We used the same phrasing of questions and column headers, and the same codes wherever possible. For each household member we asked their relationship to the household head, sex, age, and marital status, as well as details about education, employment, travel to work or school, and migration. In the migration section, one non-standard question asks how often the person has moved to urban or rural places since birth.

Making the household survey compatible with the census has two main advantages. Firstly, it provides a cross-check on whether the survey is truly representative of city conditions. For instance, the age-sex structure, language and religion, education, and occupational characteristics of the survey should closely match that obtained from the census. If the sampling design is correct, a survey with almost 3000 households should provide reliable estimates for most variables, except where proportions are very small; e.g., there are only three households in the Bangalore survey that list *Sikh* as their religion—a share too small to be captured reliably. On the other hand, if the general household patterns reflected in the sample survey are very different from the census results, we cannot put much confidence into the information gathered in the other modules for which there is no independent cross-check.

Secondly, a close match of survey and census variables may allow the use of small-area estimation techniques to extrapolate survey variables to the entire city. Recent work on the estimation of welfare indicators for small geographic areas—so-called poverty maps—has shown that it is feasible to combine survey and census data to impute measures of consumption for each household (Hentschel et al 2000, Elbers et al. 2001). These can subsequently be aggregated to generate poverty rates and inequality measures for groups of a few hundred households. The process of small area estimation is conceptually straightforward, although estimation of the reliability of the measures is complex. To estimate poverty rates for small areas, the first step is to generate a consistent consumption aggregate for each household in the survey sample using the comprehensive information typically contained in living standard surveys. Next, we can estimate a regression where the consumption aggregate is a function of a potentially large number of explanatory variables *that are available in the survey as well as in the census*. Variables that can provide large predictive power include the age, education and occupation of the household head, ownership of assets such as televisions or radios, building materials and condition of the dwelling unit, as well as fixed location effects for instance at the ward level.

After estimating the regression equations, the coefficients can be used to predict a consumption aggregate for each household using the census unit record data. While the estimates are unlikely to be reliable for each individual household, extensive evaluation of the method has shown that standard errors are well within a reasonable range when aggregated to small areas consisting of several hundred households. Clearly, the method can only be implemented reliably if the definition of census and survey variables is very similar. Also, it requires access to the individual household records of the census. Since such data are never made publicly available for confidentiality reasons, small area

estimation can only be implemented jointly with the statistical or census office, so that the micro-data never actually leave their premises and only the aggregate results are released.

Consumption module

Although urban consumption patterns *per se* are not a central question in the research work that motivated this survey, the consumption module is a core component of the survey instrument. Household consumption, adjusted for the size and age-composition of the household, is arguably the most widely accepted measure of a household's welfare status (Ravallion 1994). In almost all analyses related to urban revenue generation and service delivery, the welfare implications of government policies are a critical question both for research and urban management. A reliable welfare measure thus allows us to evaluate how any indicator varies with household welfare.

While consumption is difficult to measure comprehensively, alternative measures tend to be fraught with problems that are more difficult to address. Among the most popular, income is notoriously difficult to measure, since people tend to be reluctant to reveal their income even in an anonymous household survey. Income also ignores welfare benefits from goods that are not purchased regularly. For instance, a subsistence farmer may have a very high standard of living, even without any formal monetary income. Similarly, a person who has inherited a very nice dwelling unit realizes significant welfare benefits from it, even if he has a very low income. Another popular welfare measure is sometimes called a basic needs index. It combines several indicators such as access to essential services or characteristics of the dwelling unit into a single index. The problem, however, is that there is typically no persuasive rationale for selecting the weights for combining the indicators. Any basic needs indicator is thus subject to a number of subjective choices.

A consumption indicator is constructed to measure the welfare benefit of goods and services used by the household regardless whether these were purchased, received as gifts or in kind, self-produced, or generated from owned assets. In an urban setting, most of these goods and services will be purchased so that household expenditures are a good proxy for the consumption benefit obtained from those items. Others are more difficult to gauge. For instance, for households owning their dwelling unit we need to impute the value of housing services obtained—i.e., the equivalent of a rent paid to a landlord. Similarly, for free or subsidized services such as water or an illegal electricity connection, we need to impute the market value of the services provided so that a unit of water contributes to the household welfare measure equally, whether obtained at a free community tap, through the piped network at a subsidized rate, or from a commercial vendor. Extensive discussions about constructing consumption

measures are provided by Deaton (1998), Deaton and Zaidi (2000), Hentschel and Lanjouw (2000), among many others. Although conceptually straightforward, construction of a consumption aggregate involves a multitude of adjustments and imputations which make it a somewhat complex process.

The accuracy of the consumption aggregate will depend to a large extent on the number of consumption items that are captured in the survey. Typically, recall is better when households are prompted for individual items (e.g., yogurt, raita, cheese, etc.) rather than an aggregate category (e.g., milk products). However, including many consumption items as, for example, the Indian National Sample Survey (NSS) with hundreds of food items, increases interview time considerably and quickly leads to respondent fatigue. We attempted to find a good compromise by using the NSS data to determine the most important food categories in urban Karnataka. This allowed us to reduce the number of questions by removing or aggregating those items that are not very relevant for the study site. In total we collected information on nine cereals, up to five pulses, thirteen other food items, twelve non-food monthly expenditures (e.g., hygiene products, transportation), six miscellaneous weekly expenditures (e.g., meals eaten outside, newspapers), twenty annualized expenditures (e.g., clothing, education expenses, vehicle repair), and nineteen assets or durable goods. Ownership of assets has been found to be good predictors of overall household welfare and some of these are also captured in the census and can thus be used for small area estimation.

Figure 8 shows the distribution of per capita household consumption in the Bangalore survey population and Figure 9 shows the distribution of major consumption components by welfare quintiles. Survey results suggest that the Gini coefficient of inequality for Bangalore is 0.32. This is comparable to that of India as a whole as measured by the National Sample Survey, but lower than that for urban India (0.38).

Although not technically part of a consumption aggregate, we also ask whether the household has made any informal payments within the last month, and whether an informal payment has ever been made for any major utility or public service (water, electricity, building permits, telephone, education and police). Finally, as a last item in this section relating to the overall household budget, the survey collects information on remittances provided or received. This information helps assess the city's linkages with the rural sector, and also the contribution of funds from overseas to the local economy.

Figure 8: Distribution of per capita household consumption in the Bangalore survey

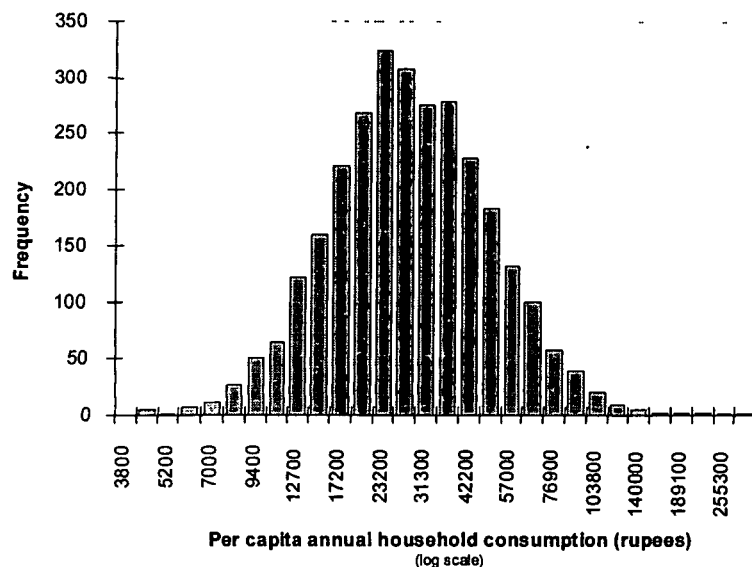
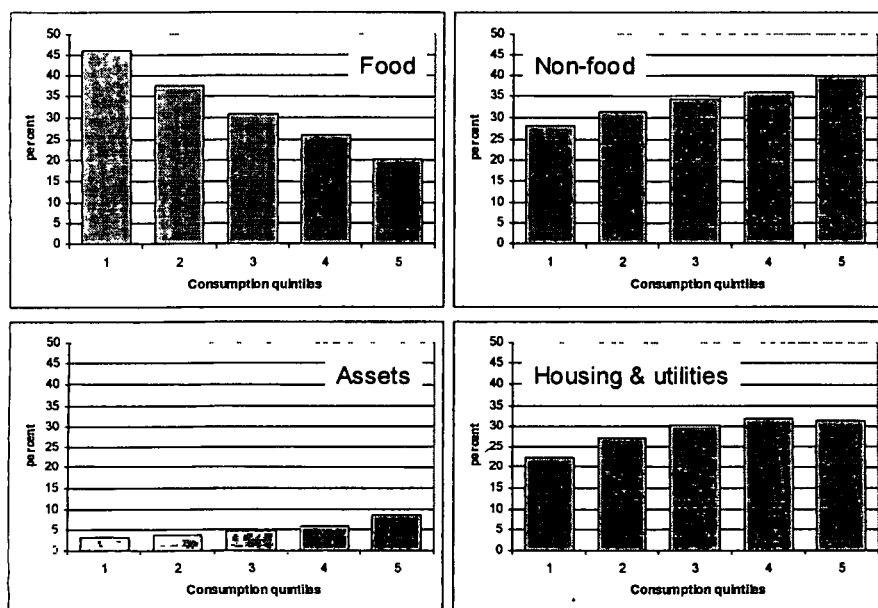


Figure 9: Household consumption shares by consumption quintiles



Service Delivery: Water module

For the public service provision portion of the survey we chose to focus on water supply. Water is a critical issue in Bangalore since local supplies are limited and the bulk of water provided by the local utility, the Bangalore Water Supply and Sanitation Board (BWSSB), comes from a source that is almost 100km to the south of the city. Due to the scarcity of water and the difficulty of providing sufficient quantities of water to a rapidly increasing number of households, a large number of water

sources and coping strategies are employed in Bangalore. During discussions with BWSSB experts and focus group interviews we identified thirteen potential water sources (Table 2). Some, such as rainwater harvesting, are not widely used at this point, and several of the sources are frequently shared among several households. Water might be provided by, among others, the city water authority, by the employer in the case of staff housing, by private entrepreneurs, a landlord or by self production through wells. The survey collects information on the details for each water source used by the household.

Table 2: Household water sources in Bangalore

Individual water connection	Mini Water System	Rainwater harvesting
Makeshift water connection	Public fountain / tap	Surface water
Individual sub-connection	Community well / tap	Bottled water
Individual hand pump	Water tankers	
Individual tubewell	Other vendor	

The water module captures detailed information about the availability of water from each source during the dry and wet seasons. Initially we considered to also distinguish between monsoon and wet season, since there are differences in water quality from specific sources. However, to simplify the survey instrument, we decided to use a simple wet/dry season distinction. The survey collects information on both the direct cost of water (including establishment of the connection) and the indirect cost such as travel to the source and waiting time, and complementary investments in pumping, storage and treatment. Detailed information on water use by source (washing, bathing, etc.) is collected to allow estimation of the quantity of water consumed in households without a metered connection. This is the majority of households in Bangalore. For households with metered connection, some additional questions capture information on the performance of the local utility.

An additional set of questions asks households about their degree of satisfaction with different aspects of water supply (location, frequency, pressure, etc.). This allows us to assess the performance of service providers in relation to the actual levels of service received as measured by the complete set of water-related variables.

The final element in the water module is a willingness to pay (WTP) exercise. It is common practice in such surveys to confront the household with a single scenario in which the household is asked how much it would be willing to spend on an ideal level of service (Whittington 1998). But a single option would ignore the fact that households' ability to pay for services will vary greatly. It may not be

realistic to provide a perfect service level to all households within the foreseeable future. Instead, great overall welfare improvement could be achieved by providing graduated service improvements to households. So, a low income household that is currently dependent on a remote community well would greatly benefit from and might also be able to pay for access to a tubewell shared among immediate neighbors, while a piped water connection would be far out of reach.

So, rather than asking households how much they would be willing to spend on a single anticipated improvement, we let households select the most realistic desirable option. The exercise proceeds in three steps. *First*, the interviewer determines from the previous questions which of five current water supply types matches the household's conditions most closely. These range from the use of surface water to an individual piped connection in the home. *Secondly*, the household is asked which of five improved supply options would be most desirable (Table 3). In selecting an option, the household is asked to consider the options realistically given that it would likely involve higher charges. For households whose current status is better than the worst option, only the better options are offered. Finally, in the *third* step, the household is asked how much they would be willing to pay in total for the improved service. Here we use a stochastic payment scheme as suggested by Wang and Whittington (2000). We start at a predetermined, realistic value for the given desired option. The household is asked how likely this charge would be acceptable—from “definitely yes” to “definitely no”. We then determine probabilities for next lower values in 25 rupee/month increments until “definitely yes” is reached and do the same for higher values until the household answers “definitely no”. For each household we can thus derive an individual demand curve that best describes the presumed willingness to pay for the specific preferred improvement.

Table 3: Water supply improvement options in the WTP exercise

- | |
|--|
| <ul style="list-style-type: none"> • Shared source in same neighborhood – dependable ground water tube well where water would be available every day for 4 hours at convenient hours. • Stationary tanker in own neighborhood – this is a 24 hour source of supply where households could have access to water at their convenience. Before the water finishes, a new tanker will replace the old one. • Individual well or pump at home – own connection to a non networked ground water source. Water available anytime of the day. • Piped water connection at home – own connection to BWSSB network. Water will be available at predetermined times every other day. • Piped water connection with service improvements – own connection to BWSSB with major service improvements. Water will be available daily, for 12-14 hours, timings will be <u>predetermined</u>, and water quality will improve. |
|--|

Housing module

The primary objective in compiling information on housing and a limited number of neighborhood characteristics is to inform analysis of the property tax system in Bangalore. As property taxes are the most important local revenue source, the degree to which the local government can provide services to a growing population depends greatly on its ability to raise funds. At the same time, taxes should be imposed using a fair allocation of the burden across all city residents.

The housing module captures characteristics of the dwelling unit such as housing category and housing delivery system, size, condition, building materials and amenities such as type of kitchen and bathroom, a yard or a balcony. Depending on tenure status of the household we then ask either about the specifics of the rental arrangement or about the legal title of the house. For home owners, several questions relate to participation in the property tax self-assessment scheme and to housing finance. For both, renters and owners, we solicit an estimate of the current value of the dwelling unit—i.e., how much a similar unit in the same neighborhood would likely sell for. We also ask about satisfaction with the current dwelling unit, whether the household is planning to move and for what reasons a move is considered. This provides some information on potential demand for higher quality housing.

To allow us to assess the impact of social capital on household behavior, we included a limited number of questions asking whether the household would participate in or contribute to any community efforts to improve services. Households were asked whether they would be willing to contribute labor and/or money to the initial investment and/or to operation and maintenance. An initial analysis of the relationships between tenure, cultural diversity and the willingness of households to participate in community action is presented in Lall et al. (2002).

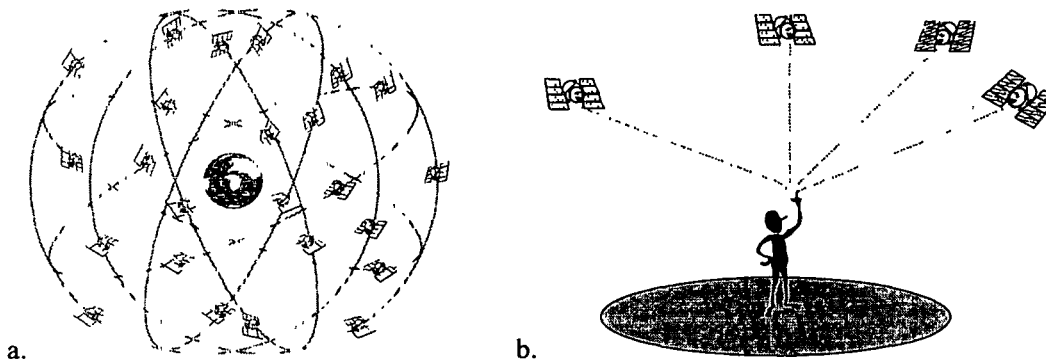
Additionally we ask about the household's perception of crime trends in their neighborhood. While crime in Indian cities is quite low by international comparison, there is some concern that it may be increasing in rapidly growing cities with large income disparities. Of course, a perception question can only shed partial light on this issue.

Survey implementation

Immediately prior to the survey, a five day training session was conducted for the survey teams and supervisors in Bangalore. We used ten teams of two enumerators rather than sending individuals to the households. The additional cost is justified in light of added survey quality (enumerators can compare notes, and one can interview the household while the other enters the responses) as well as security. Ten of the enumerators were from Delhi and most of them had prior survey experience. The other ten

were recruited in Bangalore and had not done survey work before. The goal was to twin experienced and inexperienced enumerators in order to build up capacity for survey implementation in Bangalore. The local enumerators also provided valuable language skills in a city where different languages are spoken by large subsets of the population. Before the actual survey commenced, each survey team carried out at least two sets of interviews in randomly selected households. The training sessions were designed and coordinated by SDS, and the entire survey management team participated in training the enumerators.

Figure 10: How GPS works



Each survey team was equipped with a handheld global positioning system (GPS). The GPS units read information from a subset of 24 satellites that are circling the earth (see Figure 10). The receiver determines the ground position by triangulation using signals from at least three satellites. Handheld, so-called recreational GPS units are relatively inexpensive and allow measurement of a geographic position with an accuracy of about ten to fifteen meters. In urban settings, capturing coordinates is sometimes difficult since the signal from the satellites cannot penetrate buildings or dense foliage. Enumerators were instructed to capture the coordinate at the nearest point that provides a relatively clear view of the sky. The loss of accuracy is not significant for almost any conceivable urban analysis. In fact, a perfectly accurate measurement of household location would compromise the privacy of respondents. For that reason we further degrade the position's accuracy before disseminating the data, so that the individual households cannot be determined from the sample locations.

For survey data entry, local consultants developed a tailor-made data entry module in a standard database management software (Access). The entry system uses the survey instrument as a template, provides pre-set options and choices, and contains checks on ranges and permitted values. Surveys

were entered during enumeration as they came back from the field and extensive error and consistency checking was done after data entry.

5. Conclusions

This paper has outlined a research program aimed at identifying strategies for improved urban management on the basis of credible and widely shared information. City managers face two primary challenges: (1) provide services and an infrastructure that is conducive to achieving or maintaining a productive economic environment and an adequate quality of life for all residents⁸, and (2) maintain fiscal stability through equitable revenue generation that allows sustainable financing of service provision and infrastructure investment. While higher levels of government and external factors influence local government performance, much depends on decision making at the local level, especially as decentralization increasingly places responsibilities into local hands. Making those decisions requires careful balancing of trade-offs. To put policy makers into a position to evaluate these trade-offs requires an information base that is all too often absent in urban centers in developing countries.

The ongoing urban household survey program outlined in this paper is one step towards bridging this information gap. Data collected in Bangalore, for example, has been used by local government officials to evaluate the welfare implications of proposed changes in property tax regulation. By not limiting the survey to a narrow population group (e.g., a slum survey) or a single topic, such surveys can provide a baseline for urban welfare analysis at the sub-city level and across sectors—similar to the role that the Living Standard Measurement Surveys play at the national level. Carrying out such surveys in a representative global sample of cities also enables the donor community to draw on credible and comparable data when designing urban assistance strategies.⁹ All too often such strategies are based on experience from developed countries which may or may not be relevant.

Collecting new data alone does not guarantee their use in local decision making. City governments need to be committed to using these data to improve the quality of urban management and for communicating the motivation for their decisions to the public. This implies that city management

⁸ Cohen (2002) defines a well-managed city as “one which is able to sustain processes by which the material and cultural needs of the population are met through the production and provision of shelter, infrastructure, environmental, social and cultural services.”

⁹ A sector specific example is the survey program carried out by Stephen Mayo and Shlomo Angel reported in Angel (2000).

needs to be equipped with the skills to analyze such data, and that data collection and dissemination is conducted in an open and transparent environment.

References

- Adair, A.S., Berry, J.N. and McGreal, W.S. (1996), Hedonic modelling, housing submarkets and residential valuation, *Journal of Property Research* 13, 67-83.
- Alesina, A. and E. La Ferrara (2000), Participation in heterogeneous communities, *The Quarterly Journal of Economics*, 115, 3:847-904.
- Angel, S. (2000), *Housing policy matters: A global analysis*, Oxford University Press, New York.
- Bahl, R. and J. Linn (1992), *Urban public finance in developing countries*, Oxford University Press, New York.
- Beall, J. (2001), Globalization and social exclusion in cities: framing the debate with lessons from Africa and Asia, *Environment and Urbanization*, 14, 1:41-51.
- BLUO/SDS/WB (2002), *Information-based strategies for urban management – Bangalore city report*, Bangalore Local Urban Observatory, Society for Development Studies, World Bank/DECRG, Bangalore.
- BMRDA/SDS (2000), Bangalore City Indicators Programme, Bangalore Metropolitan Region Development Authority and Society for Development Studies (2000), Bangalore.
- Can, A. (1992), Specification and estimation of hedonic housing price models, *Regional Science and Urban Economics*, 22, 453-474.
- CII (2001), Impact of removal of quantitative restrictions on Small Scale Industries, Confederation of Indian Industries, New Delhi.
- Cohen, M. (2001), Urban assistance and the material world: Learning by doing at the World Bank, *Environment and Urbanization*, 13, 1:37-60.
- Cohen, M. (2002), Don Quixote and the well-managed city, in Ruble, B.A., R.E. Stren, J.S. Tulchin and D.H. Varat (eds.), *Urban governance around the world*, Woodrow Wilson International Center for Scholars, Comparative Urban Studies Project, Washington.
- Elbers, C., J. Lanjouw, and P. Lanjouw (2001), *Welfare in villages and towns: Micro-measurement of poverty and inequality*. Development Economics Research Group (DECRG). The World Bank, Washington, D.C., *mimeo*.
- Hentschel, J. and Lanjouw, P. (2000), Household welfare measurement and the pricing of basic services, *Journal of International Development*, 12, 1:13-27.
- Hentschel, J., J.O. Lanjouw, P. Lanjouw and Javier Poggi (2000), Combining census and survey data to study spatial dimensions of poverty: A case study of Ecuador, *World Bank Economic Review*, 14, 1:147-66.
- Hentschel, J. and R. Seshagiri (2000), The city poverty assessment. A primer, World Bank, Washington, D.C., *mimeo*.
- Hirschman, A.O. (1970), *Exit, voice and loyalty*, Harvard University Press, Cambridge, MA.

- Isham, J. and S. Kahkonen (1999), What determines the effectiveness of community-based water projects: Evidence from Central Java, Indonesia on demand, responsiveness, service rules and social capital, Social Capital Initiative Working Paper No. 14, World Bank, Washington DC.
- Kahkonen, S. (1999), Does social capital matter in water and sanitation delivery: A review of the literature, Social Capital Initiative Working Paper no. 9, World Bank, Washington D.C.
- Kessides, C. (1993), Institutional options for the provision of infrastructure, Discussion paper No. 212, World Bank, Washington, D.C.
- Lall, S.V., U. Deichmann, M.K. Lundberg and N. Chaudhury (2002), Tenure, diversity and commitment: Community Participation for Urban Service Provision, Policy Research Working Paper No. 2862, World Bank, Washington D.C.
- Paul, S. (1991), Strengthening public service accountability: A conceptual framework. World Bank Discussion Paper 136, World Bank, Washington D.C.
- Paul, S., (1998), Making voice work : The report card on Bangalore's public service, Policy Research Paper No. 1921, World Bank, Washington D.C.
- Ravallion, M. (1994), *Poverty Comparisons*, Harwood Academic Publishers, Chur, Switzerland.
- SDS (2002), Information-Based Strategies for Urban Management, Proceedings of the National Seminar on the Draft Bangalore City Report, Society for Development Studies, Delhi, *mimeo*.
- Walker, I., F. Ordonez, P. Serrano and J. Halpern (2000), Pricing, subsidies and the poor. Demand for improved water services in Central America, Policy Research Working Paper No. 2468, World Bank, Washington D.C.
- Wang, H. and D. Whittington (2000), Willingness to pay for air quality improvements in Sofia, Bulgaria, Policy Research Working Paper No. 2280, World Bank, Washington, D.C.
- Whittington, D. (1998), Administering contingent valuation surveys in developing countries, *World Development*, 26, 1:21-30.

Policy Research Working Paper Series

Title	Author	Date	Contact for paper
WPS2983 Telecommunication Reform in Ghana	Luke Haggarty Mary M. Shirley Scott Wallsten	March 2003	P. Sintim-Aboagye 37644
WPS2984 Finance and Income Inequality: Test of Alternative Theories	George Clarke Lixin Colin Xu Heng-fu Zou	March 2003	P. Sintim-Aboagye 37644
WPS2985 The Impact of Minimum Wages on Employment in a Low Income Country: An Evaluation Using the Difference-in-Differences Approach	Vivi Alatas Lisa Cameron	March 2003	T. Maier 87347
WPS2986 Government Bonds in Domestic and Foreign Currency: The Role of Macroeconomic and Institutional Factors	Stijn Claessens Daniela Klingebiel Sergio Schmukler	March 2003	E. Khine 37471
WPS2987 East Asia's Dynamic Development Model and the Republic of Korea's Experiences	Ho-Chul Lee Mary P. McNulty	March 2003	L. James 35621
WPS2988 Trade Facilitation and Economic Development. Measuring the Impact	John S. Wilson Catherine L. Mann Tsunehiro Otsuki	March 2003	P. Flewitt 32724
WPS2989 Decentralization and Public Services: The Case of Immunization	Peyvand Khaleghian	March 2003	H. Sladovich 37698
WPS2990 Ways Out of Poverty: Diffusing Best Practices and Creating Capabilities— Perspectives on Policies for Poverty Reduction	Michael Klein	March 2003	F. Shah 84846
WPS2991 Tenure Security and Land-Related Investment: Evidence from Ethiopia	Klaus Deininger Songqing Jin Berhanu Adenew Samuel Gebre-Selassie Berhanu Nega	March 2003	M. Fernandez 33766
WPS2992 Market and Nonmarket Transfers of Land in Ethiopia: Implications for Efficiency, Equity, and Nonfarm Development	Klaus Deininger Songqing Jin Berhanu Adenew Samuel Gebre-Selassie Mulat Demeke	March 2003	M. Fernandez 33766
WPS2993 Dealing with the Coffee Crisis in Central America: Impacts and Strategies	Panos Varangis Paul Siegel Daniele Giovannucci Bryan Lewin	March 2003	P. Varangis 33852
WPS2994 Options for Financing Lifelong Learning	Miguel Palacios	March 2003	E. James 31756
WPS2995 Commodity Market Reform in Africa: Some Recent Experience	Takamasa Akiyama John Baffes Donald F. Larson Panos Varangis	March 2003	P. Kokila 33716

Policy Research Working Paper Series

Title	Author	Date	Contact for paper
WPS2996 Bank Competition, Financing Obstacles, and Access to Credit	Thorsten Beck Aslı Demirgüç-Kunt Vojislav Maksimovic	March 2003	K. Labrie 31001
WPS2997 Financial and Legal Institutions and Firm Size	Thorsten Beck Aslı Demirgüç-Kunt Vojislav Maksimovic	March 2003	K. Labrie 31001
WPS2998 Does Micro-Credit Empower Women? Evidence from Bangladesh	Mark M. Pitt Shahidur R. Khandker Jennifer Cartwright	March 2003	P. Kokila 31001
WPS2999 Explaining Liberalization Commitments in Financial Services Trade	Philipp Harms Aaditya Mattoo Ludger Schuknecht	March 2003	P. Flewitt 32724
WPS3000 International Climate Regime beyond 2012: Are Quota Allocations Rules Robust to Uncertainty?	Franck Lecocq Renaud Crassous	March 2003	V. Soukhanov 35721
WPS3001 An Introduction to Financial and Economic Modeling for Utility Regulators	Antonio Estache Martín Rodríguez Pardina José María Rodríguez Germán Sember	March 2003	G. Chenet-Smith 36370